UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,644	08/30/2001	Dennis W. Smith	CXU-363	9437

7590 03/01/2004

DORITY & MANNING, P.A.
P.O. BOX 1449
Greenville, SC 29602-1449

EXAMINER	
ANGEBRANNDT, MARTIN J	
ART UNIT	**PAPER NUMBER**
1756	

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. Box 1450
ALEXANDRIA, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 02182004

Application Number: 09/943,644
Filing Date: August 30, 2001
Appellant(s): SMITH ET AL.

MAILED
FEB 27 2004
GROUP 1700

Christina L. Mangelson (50,244)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 24, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement that there are no related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 16,18,19,22-26,28,29 and 36-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either** Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000) **or** Babb et al. '164, in view of Kennedy et al. '782, Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997), further in view of Shacklette et al. '498, Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300 and Kaneko et al. '307.

The rejection based upon Babb et al. '038 is withdrawn as cumulative

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct and the two amendments after final have been entered.

(5) Summary of Invention

The summary of invention contained in the brief is considered deficient by the examiner as it discusses embodiment not claimed (ie multilayered embodiments and etching/development parameters).

Polyaryl ethers containing perfluorocyclobutane (PFCB) possess low attenuations (low losses of light) in the 1,300 – 1550 nm region, exhibit a high thermooptical coefficient and can be index matched (optical coupled) to silica optical fibers making them useful in the waveguiding arts. (paragraph bridging pages 7-8). PFCB homopolymers are known to be useful in forming waveguides (page 3, lines 15-20). PFCB copolymers can be made to achieve desired refractive indices through appropriate choices of starting materials/monomers (page 5, line 28 to page 6, line14, page 8,lines 9-13, page 12,lines 4-9 and figure 4). The use of high solids coating solutions allows thicker films to be formed, which increases their utility in the waveguiding arts (page 8/lines 14-26, page 4,lines 7-12, page 11, lines 1-6, page 13,lines 9-12 and figure 3). Baking of the coating in a nitrogen atmosphere at 235- 325 degree C to thermally cure the coatings is disclosed. (page 10, lines11-13). A cladding layer of a material having a lower refractive index than the core material may be used in contact with the core layer (page 6,lines 15-18; page 1,lines 22-24 and original claim 18).

(6) Issues

The appellant's statement of the issues in the brief is incorrect. A correct statement of the issues is as follows:

A) Are claims 16,18,19,22-26,28,29 and 36-44 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), in view of Kennedy et al. '782, Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997), further in view of Shacklette et al. '498, Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300 and Kaneko et al. '307 as set forth in the record ?

B) Are Claims 16,18,19,22-26,28,29 and 36-44 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Babb et al. '164, in view of Kennedy et al. '782, Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997), further in view of Shacklette et al. '498, Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300 and Kaneko et al. '307 as set forth in the record ?

C) The rejection based upon Babb et al. '038 is withdrawn as cumulative to the rejection based upon Babb et al. '164.

(7) Grouping of Claims

Appellant's brief includes a statement that claim groupings (16,19,22-26,29 & 36) and (18,28 and 37-44) do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,438,3067	Kaneko et al.	08/2002	(03/2000)
5,850,498	Shacklette et al.	12/1998	
5,246,782	Kennedy et al.	09/1993	
5,426,164	Babb et al.	06/1995	

Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000)

Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997)

Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims and are separated to correspond with the issues and arguments section of the appeal brief (see pages 4-11of brief):

A) Claims 16,18,19,22-26,28,29 and 36-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), in view of Kennedy et al. '782, Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997), further in view of Shacklette et al. '498, Shaw et al. "Fluoropolymer nanotube composites for coatings and nonoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300 and Kaneko et al. '307.

Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/2000 and on-line 5/19/2000) teach the formation of the prethermoset oligomeric solutions of 1-co-2 are taught with respect to figure 4-6. The use of these polymers in optical waveguides is disclosed throughout. Useful aryl ether linkages are taught in scheme 2 (page110) and scheme 3 (page 112). The disclosure of the prethermoset oligomeric solutions being spin coated or melt processed and then finally cured by baking at 235-325 degrees is disclosed. (page 110, right column). The use of mesitylene as the solvent and spin coating to thicknesses of 3-6 microns is also disclosed. (page 110, right column). The use of 50 wt. % mesitylene as the solvent is disclosed. (page 114, left column). The refractive indices of the different polymers are also disclosed. The use of these materials in

dielectric waveguides and optical cladding layers is disclosed. (page 109, left column, lines 15-20). The PFCB polymers are described as having excellent processability, optical transparency, high temperature performance and low dielectric constants (abstract). The section related to waveguides and optical fibers describes the simple choice of co-monomer as allowing control of refractive indices, glass transition temperature and long term thermal stability (page 113, right column, line 34-38, table 3). The optical loss for the copolymers and polymer 2 have not been determined, but are predicted to be similar to or slightly higher than the 0.25 dB/cm for polymer 1 (page 114, right column, lines 7-15). The refractive index characteristics of the co-polymer have been determined. (figure 6, table 3 and appropriate choice of the monomer composition allows control of the exact optical properties. (page 114, right column, line 16 to page 115, left column, line 6).

Kennedy et al. '782 teaches various coating processes for PFCB polymers including spin coating (spinning) and dip coating (15/9-55) The effects of the percent solids in the coating process and spinning speed on the thickness of the resulting coating is disclosed. Thicknesses of up to 24.53 microns are shown with spin coating of solutions with 70% solids and 8.31 microns for solutions with 60% solids. (table 5, column 36).

Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) teaches optical waveguide coatings of 10 micron for TVE -PFCB polymers and that these form single mode waveguides.

Shacklette et al. '498 teaches the use of upper cladding layers for optical waveguides. (figure 1,1a and 13/10). The thickness of the core layer is 5 to 500 microns and the cladding layer is at least 3 microns. (9/59-11/65).

Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300 teaches the refractive indices of the polymers and copolymers. The simple choice of co-monomer allows control of refractive indices, glass transition temperature and long term thermal stability (page 300, right column, lines 1-3).

Kaneko et al. '307 teaches that the polymers used in the core and cladding layers may be the same materials or different, but that the cured polymer must have a refractive index less than that of the cured polymer core. (7/65-67 and 8/10-14). The use of cladding layers of 15 microns is disclosed (16/22-31).

It would have been obvious to one skilled in the art to coat other TVE-PFCB polymers, such as those disclosed by Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), using the coating and baking in a nitrogen atmosphere described on page 110 at lines 6-15 to the thicknesses disclosed as useful for PFCB polymeric waveguide cores by Fischbeck et al., "Singlemode optical waveguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) or Shacklette et al. '498 to evaluate their optical properties and potential as waveguiding materials based upon the desirable properties for PFCB polymers and the required thicknesses for single mode operation evidenced in Fischbeck et al., "Singlemode optical waveguides using high temperature stable

polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) using high solid content solutions as taught by Kennedy et al. '782 to form thicker coatings with the desired optical and thermal properties based upon the direction within Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) that the composition of the monomer composition used can be varied to control the refractive indices, glass transition temperature and long term thermal stability (page 113, right column, line 34-38, table 3). The description of the low losses expected for these copolymers as set forth on page 114, right column, lines 3-15. In addition to the basis provided above, the examiner holds that it would have been obvious to add a upper cladding layer (the substrate acts as the lower cladding layer) using known thicknesses for the cladding layer, such as those disclosed by Shacklette et al. '498 in the invention resulting from the combination of Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000) with Kennedy et al. '782 and Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) to improve the waveguiding properties of the resultant articles by reducing TIR losses by providing cladding layer, such as a Perfluorocyclobutane (PFCB) polyaryl ether copolymeric cladding layer, with a reasonable expectation of success as it is known in the art to use the same materials for the core and cladding layer as evidenced by Kaneko et al. '307 and the refractive indices of the copolymers can be controlled by optimizing the monomer composition used set forth in Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300, right column, lines 1-3 and

Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) at page 113, right column, line 34-38, table 3 and the direction to use PFCB polymers in cladding layers by Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) at page 109, left column, lines 15-20.

B) Claims 16,18,19,22-26,28,29 and 36-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Babb et al. '164, in view of Kennedy et al. '782, Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997), further in view of Shacklette et al. '498, Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300 and Kaneko et al. '307.

Babb et al. '164 in example 2 which make a copolymer of 4,4'-bis(trifluoroethylenyloxy)-alpha-methylstilbene and 1,1,1-tris(4'-trifluoroethylenyloxyphenyl) ethane (TVE) and the crosslinking thereof and where the polymer solution uses 1 g of polymer to 10 ml of benzene (8.787g) and the benzene is evaporated by heating. The specific direction to copolymerize is taught at col. 19/lines 7-19. The use of the term polymer to embrace oligomers is disclosed. (3/3-7). The description of the optical coatings of these polymers as being transparent and suitable for lenses or other devices where optical transparency is important is disclosed. (22/56-60).

It would have been obvious to one skilled in the art to coat other TVE-PFCB polymers, such as those disclosed by Babb et al., '164, using the coating and baking described in example 2

of Babb et al., to the thicknesses disclosed as useful for PFCB polymeric waveguide cores by Fischbeck et al., "Singlemode optical waveguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) or Shacklette et al. '498 to evaluate their optical properties and potential as waveguiding materials based upon the desirable properties for PFCB polymers and the required thciknesses for single mode operation evidenced in Fischbeck et al., "Singlemode optical waveguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) using high solid content solutions as taught by Kennedy et al. '782 to form thicker coatings with the desired optical and thermal properties based upon the direction within Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300, right column, lines 1-3 that the composition of the monomer composition used can be varied to control the refractive indices, glass transition temperature and long term thermal stability. In addition to the basis provided above, the examiner holds that it would have been obvious to add a upper cladding layer (the substrate acts as the lower cladding layer) using known thicknesses for the cladding layer, such as those disclosed by Shacklette et al. '498 in the invention resulting from the combination of Babb et al., '164 with Kennedy et al. '782 and Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) to improve the waveguiding properties of the resultant articles by reducing TIR losses by providing cladding layer, such as a Perfluorocyclobutane (PFCB) polyaryl ether copolymeric cladding layer, with a reasonable expectation of success as it is known in the art to use the same materials for the core and cladding layer as evidenced by

Kaneko et al. '307 and the refractive indices of the copolymers can be controlled by optimizing the monomer composition used set forth in Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300, right column, lines 1-3 and the direction to use these as optical coatings within Babb et al. '164 (22/56-60).

C) As this rejection has been withdrawn, the arguments of the applicant on pages 11 and 12 are moot.

(11) Response to Argument

The responses to the arguments are separated to correspond with the issues and arguments section of the appeal brief (see pages 4-11of brief)

A) The applicant argues that the Smith et al. reference merely describes the polymerization/processing of the PFCB polymers and their possible use as dielectric waveguides, optical cladding layers and other coatings. The applicant states that only the formation of the co-polymers in solution is taught, and not their use in films. The applicant further states that Smith et al does not teach forming a waveguiding core of the copolymer materials with a cladding layer and in particular does not teach the cladding layer being a PFCB copolymer. (page 6 of the brief). The applicant state that impermissible hindsight has been used to formulate the rejection and no motivation is found in the prior art to combine the references and/or render the invention obvious. The applicant argues that the obvious to try standard has been applied by the

examiner when describing the evaluation of the optical properties of waveguides formed using PFCB copolymers, rather than PFCB polymers. The applicant also points to Shah et al. concerning the lack of determination of some optical properties of the PFCB copolymers (page 7 of the brief).

The examiner notes the references clearly provide motivation to optimize the various optical and thermal properties, noting that the refractive indices of the copolymers can be controlled by optimizing the monomer composition used set forth in Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300, right column, lines 1-3 and Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) at page 113, right column, line 34-38 and table 3. The examiner holds that this provides direction to one skilled in the art beyond the argued "obvious to try" by clearly establishing motivation to use to the copolymers. The Smith et al. reference specifically describes the optical and thermal properties of the copolymers with respect to table 3 and figure 6 in the section entitled "Optical fiber and waveguides" and therefore the contention that the use of the PFCB copolymers in waveguiding cores is not taught is without merit. The examiner also points to the direction to the use of the PFCB polymers described in Smith et al. as "natural candidates for applications, such as ....dielectric wave guides, optical cladding layers ... (Smith et al., page 109, left column, lines 15-20). The lack of specific information concerning some of the thermal and optical properties would motivate the experimentor, one skilled in the art, particularly in view of the desirable optical and thermal properties already known and the known ability to vary these properties based upon controlling the exact monomer composition used as discussed by Shaw et al.

"Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300, right column, lines 1-3 and Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) at page 113, right column, line 34-38, figure 6 and table 3. The examiner points out that the one way to determine the optical losses (dB/cm) would be to form the waveguide from the copolymeric PFCB material and measure it. If this property is important, and in the waveguiding art it is, then this lack of knowledge would provide additional motivation to form a waveguide core from the copolymer PFCB materials of Smith et al as discussed above.

The applicant argues that Shacklette et al., is not combinable as the materials described therein are different from those of Smith et al., particularly their T_g and mode of curing (thermal curing vs. photocuring) (page 8 of the brief). The applicant argues that Kaneko et al. is not combinable with the other references, particularly with Smith et al., based upon the modes of formation of the core and cladding layers of Kaneko et al., which use a single material and the mode of curing (thermal curing vs. photocuring) (page 8 of the brief). The applicant also argues that using the materials of Smith et al., in the process of Kaneko et al. would not work as the modes of curing are different.

In response to the above arguments, the examiner points out that the prior art of record, clearly teach that either photosensitive or thermally cured polymers can be used as optical waveguide core or cladding materials. The references, in particular Shacklette et al. '498 and Kaneko et al. '307, support this position. The mode of curing would seem moot as the examiner is not applying the entire processes of either Shacklette et al. '498 or Kaneko et al. '307 to the PFCB copolymers of Smith et al., but are using these references to establish the conventionality

of adding a cladding layer, rather than relying upon the air/core interface to facilitate the total internal reflection process. The addition of two different references provides additional weight concerning the conventionality of the use of cladding layers and when combined with the direction within Smith et al. on page 109, in the left column at lines 15-20 concerning the use of PFCB polymers as waveguide materials and cladding materials renders the use of cladding layers in general obvious to one of ordinary skill in the art. The applicant's arguments also neglect the teachings in Kaneko et al. (column 7/lines 65-67 and column 8/lines 10-14) that the polymers used in the core and cladding layers may be the same materials or different, but that the cured polymer must have a refractive index less than that of the cured polymer core which is particularly interesting when coupled with the teachings concerning the refractive indices of the PFCB copolymers by Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300, right column, lines 1-3 and table 1 and Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) at page 113, right column, line 34-38 and table 3 and when combined with the direction within Smith et al. on page 109, in the left column at lines 15-20 concerning the use of PFCB polymers as waveguide materials and cladding materials renders the use of PFCB polymeric and copolymeric cladding layers obvious to one of ordinary skill in the art. Based upon compatibility and refractive index being the most important properties as established by Kaneko et al., the mode of curing or the T_g is clearly relatively unimportant to the function of a cladding layer in facilitating total internal reflection.

B) The applicant argues that there is no motivation in Babb et al. '164 to use the PFCB copolymers in waveguides. The applicant argues that the closest relevant text refers to their use in optical lenses or other devices where optical transparency is important. (page 10 of the brief). Lacking such motivation, the rejection is argued to be reduced to "obvious to try", which does not meet the standard for obviousness. The applicant argues that the polymers of Babb et al., '164 are photosensitive and could not be used in the manner described by Fischbeck et al. (pages 10 and 11 of the brief). The applicant describes the polymers of the instant invention as thermally cured (page 11 of the brief)

The examiner notes that the mode of forming the polymer is through photopolymerization/crosslinking in the Babb et al. '164 reference. The photoactive sites on these molecules are shown in columns 5 and 6 and include stilbenes (column 5/line 5) embracing the formula shown in figure 2e of the instant application. The polymerization/curing is disclosed by Babb et al. '164 as occurring using free radical polymerization (21/35-48), but clearly forms PFCB polymers with different aryl moieties in example 2. The instant application describes free radical mediated thermal curing on page 8 at lines 4-8. It seems to the examiner at this time, that the mode of curing of the polymer is moot as both modes of polymerization form PFCB copolymers and the coating formed in example 2 of Babb et al. '164 is a polymeric coating formed by heating a prepolymer to 45 degrees in benzene, before coating, coating the resultant polymers and further heating the polymeric coating to 120 degree C after coating step. As the photosensitivity is derived from one of the aryl groups described by the applicant (see figure 2e), it seems that it cannot be said that their polymer is not photosensitive as argued by the applicant. Irrespective of the curing at least the article would seem to be the same, even if the heating of the

coating at 120 degrees C described by Babb et al. '164 did not induce any thermal curing. The mode of curing certainly would not lend patentability to the same resultant article cured in a different manner absent some evidence that the resultant polymers are different. The examiner further notes that motivation to use PFCB copolymers in the core is found in Shaw et al. "Fluoropolymer nanotube composites for coatings and nanoscopic probes", Polym. Mater. Sci. & Eng., (ASC div PMSC) 2000 Vol. 82, pp 300, right column, lines 1-3 and table 1 and its use in cladding layers flows from the coatings applied to optical articles in Babb et al. in column 22 at lines 56-60 when combined with the teachings concerning the optical requirements for cladding layers relative to the optical properties of the cladding layer by Kaneko et al. These provide the motivation beyond the "obvious to try" asserted by the applicant. As discussed above, the prior use of both thermally and photocured materials in the prior art as core and cladding materials undercuts the divergence argued by the applicant.

C) As this rejection has been withdrawn, the arguments of the applicant on pages 11 and 12 are moot.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Martin J Angebranndt
Primary Examiner
Art Unit 1756

February 19, 2004

Conferees:

Mark F. Huff,
Supervisory Patent Examiner
Art Unit 1756

Patrick J. Ryan
Supervisory Patent Examiner
Art Unit 1745

John E. Vick, Jr.
Dority & Manning
Attorneys at Law, P.A.
P.O. Box 1449
Greenville, SC 29602